

AMENDMENTS TO THE CLAIMS

1. (Currently amended) A radar comprising:

a transmitter ~~transmitting and receiving means for~~ transmitting a transmission signal having an alternately repeating ~~an~~ upstream-modulation section in which a frequency gradually increases and a downstream-modulation section in which the frequency gradually decreases; ~~and for~~

a receiver receiving a reception signal serving as that is a reflection signal of the transmission signal reflected from a target;

an analyzer ~~frequency analyzing means for~~ acquiring data on a frequency spectrum of a beat signal for the transmission signal and the reception signal;

an extractor ~~pair extracting means for~~ extracting, from among a plurality of first projecting portions appearing in the frequency spectrum of the beat signal in the upstream-modulation section and a plurality of second projecting portions appearing in the frequency spectrum of the beat signal in the downstream-modulation section, a pair of projecting portions resulting from ~~caused by~~ reflection of the transmission signal by ~~an identical~~ the target; and

a detector ~~means for~~ detecting a distance to the target and a relative speed with respect to the target in accordance with frequencies of the extracted pair of ~~two~~ projecting portions ~~forming the pair~~, wherein

the extractor ~~further pair extracting means includes means for~~ predicting a center frequency of peak frequencies of the first and second projecting portions at a ~~timing a certain period of~~ point in time after a predetermined time based on ~~timing in~~ ~~accordance with~~ a peak frequency of a the first projecting portion at the predetermined

~~time, timing~~ and ~~for~~ extracting ~~a~~ the pair of projecting portions acquired at the ~~timing~~
~~after the certain period of~~ point in time in accordance with the center frequency.

2. (Currently amended) A radar comprising:

a transmitter ~~transmitting and receiving means for~~ transmitting a transmission signal having an alternately repeating ~~an~~ upstream-modulation section in which a frequency gradually increases and a downstream-modulation section in which the frequency gradually decreases; ~~and for~~

a receiver receiving a reception signal serving as that is a reflection signal of the transmission signal reflected from a target;

an analyzer ~~frequency analyzing means for~~ acquiring data on a frequency spectrum of a beat signal for the transmission signal and the reception signal;

an extractor ~~pair extracting means for~~ extracting, from among a plurality of first projecting portions appearing in the frequency spectrum of the beat signal in the upstream-modulation section and a plurality of second projecting portions appearing in the frequency spectrum of the beat signal in the downstream-modulation section, a pair of projecting portions resulting from ~~caused by~~ reflection of the transmission signal by ~~an identical~~ the target; and

a detector ~~means for~~ detecting a distance to the target and a relative speed with respect to the target in accordance with frequencies of the extracted pair of ~~two~~ projecting portions ~~forming the pair~~, wherein

the extractor ~~further pair extracting means includes means for~~ predicting a center frequency of peak frequencies of the first and second projecting portions at a

~~timing a certain period of point in time~~ before a predetermined ~~time based on timing in accordance with~~ a peak frequency of a ~~the~~ second projecting portion at the predetermined ~~time, timing and for~~ extracting a ~~the~~ pair of projecting portions acquired at the ~~timing before the certain period of point in time~~ in accordance with the center frequency.

3. (Currently amended) The radar according to Claim 1 ~~or 2~~, wherein

the ~~extractor pair extracting means~~ extracts the pair of projecting portions by using, as the ~~certain period of point in time~~, nT satisfying a relationship, $nT \approx f_0 / (2\Delta F \cdot f_m)$, ~~wherein (here, n represents a desired natural number,)~~ ~~where~~ T represents a measurement cycle in which the frequency analysis is performed, $1/f_m$ represents a modulation cycle ~~serving as a cycle~~ including the upstream-modulation section and an adjacent ~~the~~ downstream-modulation section, f_0 represents a center frequency of the transmission signal, and ΔF represents a width of a frequency shift in the upstream-modulation section and the downstream-modulation section.

4. (Currently amended) A radar comprising:

~~a transmitter transmitting and receiving means for~~ transmitting a transmission signal ~~having an~~ alternately repeating an upstream-modulation section in which a frequency gradually increases and a downstream-modulation section in which the frequency gradually decreases; ~~and for~~

~~a receiver~~ receiving a reception signal serving as ~~that is~~ a reflection signal of the transmission signal reflected from a target;

an analyzer ~~frequency analyzing means for~~ acquiring data on a frequency spectrum of a beat signal for the transmission signal and the reception signal;

an extractor ~~pair extracting means for~~ extracting, from among a plurality of first projecting portions appearing in the frequency spectrum of the beat signal in the upstream-modulation section and a plurality of second projecting portions appearing in the frequency spectrum of the beat signal in the downstream-modulation section, a pair of projecting portions resulting from ~~caused by~~ reflection of the transmission signal by ~~an identical~~ the target; and

a detector ~~means for~~ detecting a distance to the target and a relative speed with respect to the target in accordance with frequencies of the extracted pair of ~~two~~ projecting portions ~~forming the pair~~, wherein

the extractor ~~further pair extracting means includes means for~~ predicting a center frequency of peak frequencies of the first and second projecting portions at a predetermined ~~timing time~~ by using a the peak frequency of a the first projecting portion at a ~~timing a certain period of~~ first point in time before the predetermined ~~timing time~~ and a the peak frequency of a the second projecting portion at a ~~timing the certain period of~~ second point in time after the predetermined ~~timing time~~, and ~~for~~ extracting a the pair of projecting portions acquired at the predetermined ~~timing time~~ in accordance with the center frequency.

5. (Currently amended) The radar according to Claim 4, wherein,

the extractor excludes a combination of the first and second projecting portions at the predetermined time from pair candidates:

when a second projecting portion forming a the pair with the first projecting portion at the ~~timing before the certain period of~~ first point in time that is used for predicting the center frequency ~~at the predetermined timing~~ and that exhibits a frequency difference substantially equal to a difference between the peak frequencies of the first and second projecting portions forming the pair at the predetermined ~~timing~~ time does not exist, and/or

when a first projecting portion forming a the pair with the second projecting portion at the ~~timing after the certain period of~~ second point in time that is used for predicting the center frequency ~~at the predetermined timing~~ and that exhibits the frequency difference does not exist,

~~the pair extracting means excludes a combination of the first and second projecting portions at the predetermined timing from pair candidates.~~

6. (New) The radar according to Claim 2, wherein

the extractor extracts the pair of projecting portions by using, as the point in time, nT satisfying a relationship, $nT \approx f_0/(2\Delta F \cdot f_m)$, wherein n represents a natural number, T represents a measurement cycle in which frequency analysis is performed, $1/f_m$ represents a modulation cycle including the upstream-modulation section and the downstream-modulation section, f_0 represents a center frequency of the transmission signal, and ΔF represents a width of a frequency shift in the upstream-modulation section and the downstream-modulation section.